Sow Wastage and Effects on Stayability of Sows: some German results

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Introduction

In weaner production in pigs a replacement rate of 40 - 50% per year is commonly recommended to keep an ideal parity profile to maximise litter size and litters per sow per year. There is always an optimum replacement rate for different type of farms. For breeders the optimum replacement rate would probably be higher to achieve more genetic gain per year by reducing the generation interval. There is probably also a difference between farms raising their own replacement and those farms buying replacement gilts. The latter is a common procedure in most European countries. Often studies on reasons for removal of sows indicate that over 50% of removal is due to unplanned reasons. First results from Australian data (Paterson, 1995) show that 72% of all removals were for an unplanned culling reason also including a death rate of 9%. In this paper some German results are shown.

Culling reasons in weaner production

All German studies have to be seen under the fact that most farms are not producing their own replacement gilts but buy them from other specialised multiplier farms. The price of replacement gilts (crossbreds or purebreds) is depending on the current marked price of slaughter pigs plus a fixed supplementary charge. This extra charge is depending on the breeding company or breeding organisation. There is some sort of warranty on young gilts until the first pregnancy with the possibility to make a complaint. Table 1 shows relative and absolute number of complaints made within a breeding company.

Table 1. Absolute and relative number of complaints for young gilts (BHZP)

Reason of complaint	number	percent
no complaint	69670	97.2
transport damage	84	0.1
leg problems	382	0.5
fertility problems	1205	1.7
other reasons	392	0.5

Table 1 shows that the total amount of complaints is less than 3 percent. For other breeding companies no results about complaints are known or published.

In table 2 culling reasons for different breeds or levels within a breeding program are shown.

Table 2. Culling reasons for different breeds or levels within a breeding program

	Crossbreds	BHZP F1	BHZP LR	BHZP nucleus
no. of sows	2474	7019	6238	9503
reproduction	21.5%	19.0%	27.8%	32.2%
litter size	30.4%	24.4%	11.2%	10.7%
age	17.0%	22.3%	20.6%	19.9%
constitution	8.7%	8.6%	21.9%	14.2%
other	22.4%	25.7%	18.5%	23.0%

The results in table 2 indicate that there is a difference in constitution and in reproductive failures between purebred and crossbred sows. The crossbred sows in column 1 and 2 show similar constitution problems around 8 to 9% while the purebred sows in the last two columns have more problems with constitution. Similar results can be seen for reproductive failures. The data of the last column include 2 dam and 2 sire lines. This could explain the amount of 32 percent of culling because of reproductive failure. The culling rate because of age is very similar in all data sets. In total there is more potential for wanted culling because of litter size in the crossbred sows (25 to 30%) than in the purebred lines (only 11%).

Differences shown in table 2 could also be explained by the fact that the farms included in columns 1 and 2 are buying replacement gilts from specialised farms while the other farms produce their own replacement.

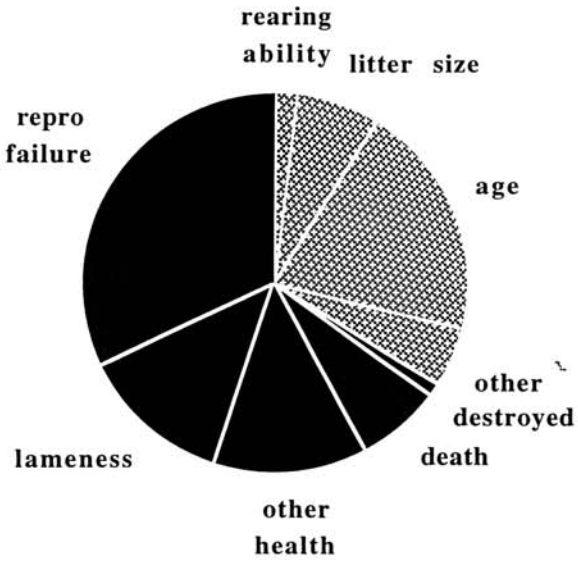
The average litter number for the crossbreds, the BHZP F1 and the BHZP LR are 4.2, 4.8 and 4.1 respectively. For the nucleus data from BHZP the average litter number is only 2.8 which is mainly an effect of the breeding strategy within the company to keep the generation interval short.

For the data from the BHZP nucleus farms more detailed culling reasons are available that can be compared with the Australian data from Paterson (1995). The following figure 1 shows the comparison of both data sets. Concerning culling because of lameness and reproductive failures very similar results are found. Looking at culling rates because of death and destroyed sows the Australian data show with 16 percent twice as much sows being removed from the herd than the German data. The high amount of sows culled in the BHZP nucleus farms because of age is probably not representative for normal German producers. Within all nucleus farms in most breeding companies there is a high turnover rate to reduce generation interval and increase genetic gain per year. The German farms seem to have more problems with health reasons (13% culling) than Australian farms (8% culling).

Concerning the culling because of rearing ability, litter size, age and other reasons to be wanted culling the German data show 34% versus 28% in the Australian data.

In both the German and the Australian data there appears to be significant variation between farms in rates of unplanned culling and deaths. This indicates that there is potential for veterinarians and managers to investigate unplanned culling and deaths in herds where problems are evident.

Figure 1. Sow culling reasons for Australian and German data



Effects on stayability of sows

The culling decision within a farm is definitely a subjective decision of the farm manager that is influenced by the amount of unwanted culling. To get an idea of possible effects on culling decisions data from weaner production farms from the BHZP breeding company were analysed with a survival analysis (von Brevern, 1995). Analysing stayability of sows the two problems of non linearity of effects and unknown stayability for animals still in production (censored data) arise. The survival analysis is a possible tool to handle both problems properly.

Three types of effects were included in the analysis:

1. Effects from the rearing phase of the sow
   (daily gain, leg score, multiplier farm)

2. Effects from the production phase of the sow
   (litter number, piglets born and weaned per litter, stadium of sow, farm)

3. Other effects
   (average price of weaners within last 6 months)

In total data from about 15000 sows with litters were available over a period of 10 years. The price of weaners within the same period was also available. All effects were included as so called 'time dependent covariates' with classes of effects for all variables.

All three types of effects show a significant influence on the stayability of a sow. The most important effects are those from the production phase followed by the price of weaners within the last 6 months. Some of the effects from the rearing phase are significant but of minor importance than the others. In figures 2 to 4 the results are summarised.

Figure 2 shows the culling risk ratio within litter number depending on leg score in multiplier farm. In the multiplier farms all sows are getting a leg score including 3 classes. Only sows with correct legs (score 3) and those with minor non permanent leg problems (score 2) are sold to the weaner production farms. Figure 2 indicates that the sows with leg score 2 have a higher culling risk ratio within all litters than sows with correct legs at test.

In Figure 3 the culling risk ratio within litter number in different periods after weaning is shown. The figure clearly indicates the period where most of sows are culled which is the period between 0 to 5 days after weaning. There is an increasing risk of culling within this period from first to later litters. A similar increasing risk of culling from first to later litters occurs for the period 5 to 30 days after weaning but on a much lower level. The culling risk ratio in the period more than 30 days after weaning maintains on the same low level within all litters.

Figure 4 summarises the culling risk ratios for number of piglets weaned, price level of weaners within the last six months and the sow's leg score to indicate the relative importance of these effects. The figure clearly testifies that the effect of number of piglets weaned is much more important than the effect of price level of weaners or the sow's leg score. The figure also indicates that there is a much higher culling risk ratio after the fourth litter than in earlier litters. This effect could be different in farms producing their own replacements. The influence of the price level on the culling decision could be explained by the better cash flow in times of high prices for weaners, the most important source of income for these farms. Because there is no direct relationship between the price of weaners and the price for a young replacement gilt the culling decision is made earlier in times of high prices for weaners than in times with lower price levels.

Figure 2. Culling risk ratio within litter number depending on leg score in multiplier farm (as deviation from correct legs)

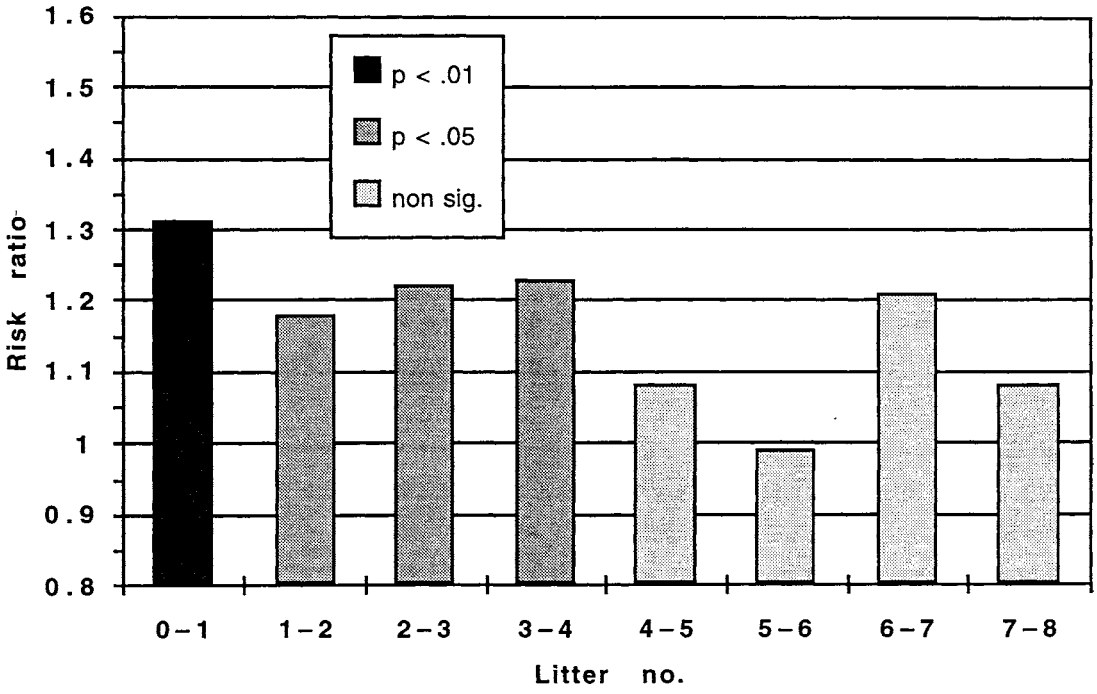


Figure 3. Culling risk ratio within litter number in different periods after weaning

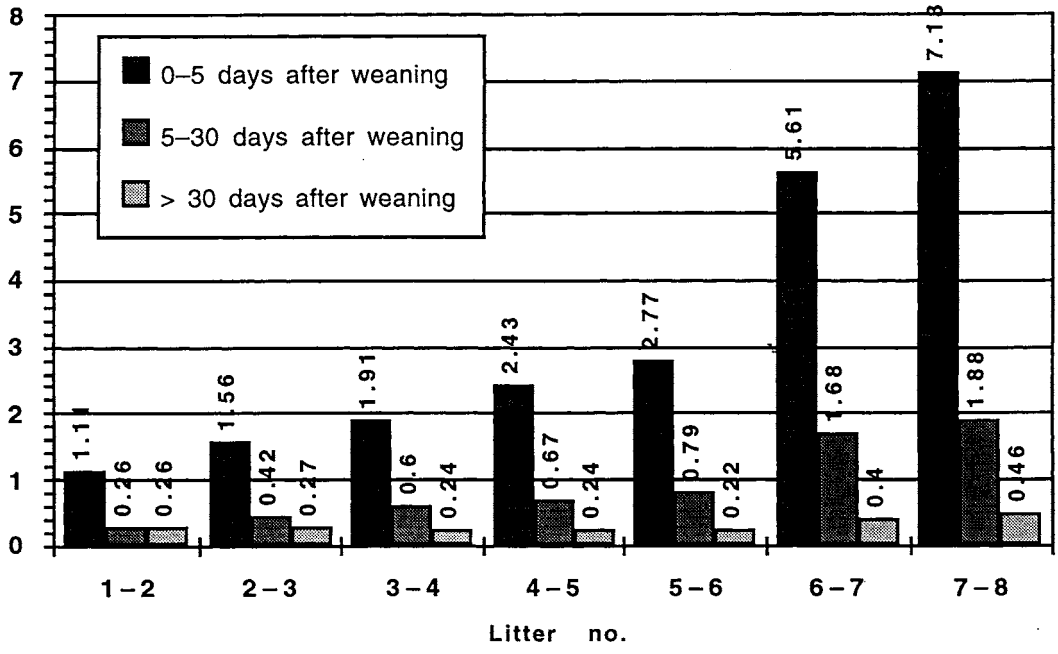
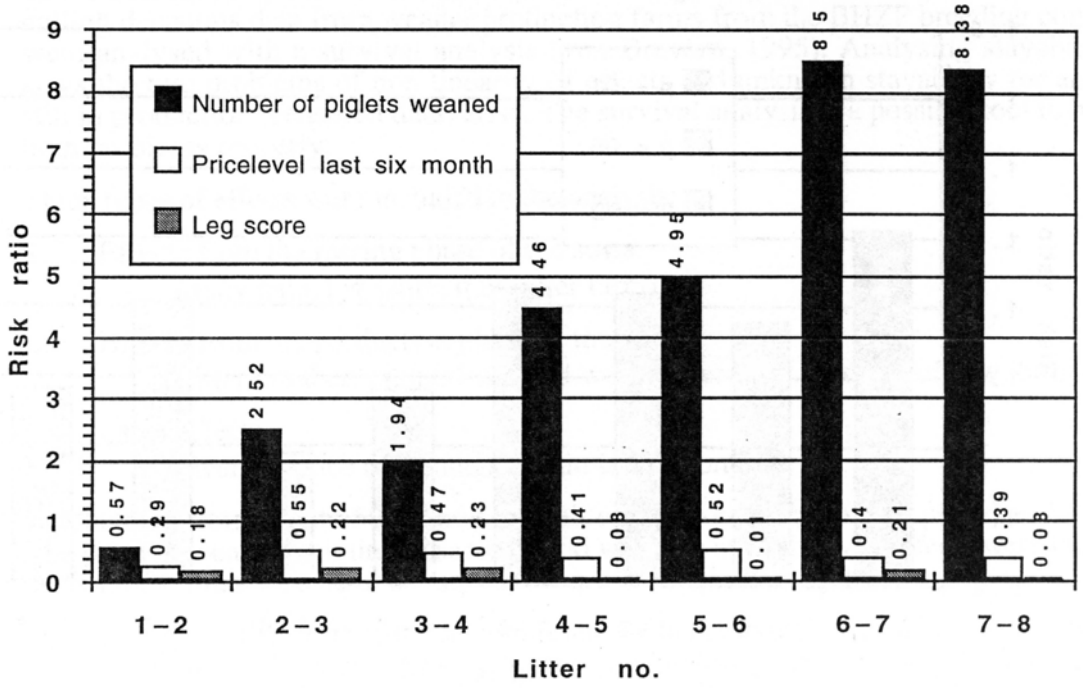


Figure 4. Range of culling risk ratio for number of piglets weaned, price level last six months and leg score



Conclusions

High rates of breeding sow turnover are often an effect of unplanned culling ('sow wastage'). Within German farms about 65% of culling is due to unwanted culling while Australian data on average show 72% of unwanted culling. The major reasons of unwanted culling are reproduction failures, followed by lameness and other health problems.

There is a potential for veterinarians and managers to reduce unwanted culling especially in farms with high deaths rates and health problems.

A survival analysis shows the important phases and effects of culling decisions. The highest culling risk ratio for a sow occurs in the period 0 to 5 days after weaning with an increasing risk ratio from first to later litters. The effect of number of piglets weaned has a much higher effect on culling decisions than other effects like price level of weaners or sow's own leg score at test. Most of the culling decisions because of number of piglets weaned are made after the fourth litter.

Although the effects of the rearing phase of the young gilt have only a small impact on the culling decision, it seems to be worthwhile to select sows on a leg scoring system to reduce culling because of leg problems. Also selection on daily gain has a positive effect on culling risk ratio.